Mobile telecommunications device browser

Field of the invention

This invention relates to a mobile telecommunications device with an improved browser for navigating between pages at different network addresses and home pages.

Background

Conventional mobile telecommunications devices such as telephone handsets, have been designed primarily for speech calls and have only a limited capability for handling data. For example, in GSM, a short message service (SMS) has been provided to permit the user to send and receive short text messages that can be transmitted through a cellular public land mobile network (PLMN). More recently, recommendations have been developed to provide a wireless application protocol (WAP) to promote common standards and specifications for data services that operate over wireless communication networks. WAP enabled telephone handsets have been developed which allow the user to access remote servers. Data content is provided in a mark up language, similar to conventional hyper text mark up language (HTML) known as a wireless mark up language (WML), which is configured to allow a page of HTML data to be displayed as a deck of individual cards which are of the size suited for display on the relatively small display screen usually available on a mobile device such as a cellular telephone handset or personal digital assistant (PDA).

The data is supplied by WML servers at individual network addresses, with a homepage which act as an entry point to a particular site together with further pages or decks with individual addresses that can be navigated by the user. To this end, the mobile device is provided with a browser to display the data.

A WML server can be accessed by dialling an individual telephone number associated with a WAP gateway which acts as a proxy server between the WML server itself and the mobile device, which acts as the client.

5   Newer, faster data services for mobile communication devices have been developed, including I-Mode, GPRS and UMTS which operate in a generally similar way, with the mobile device acting as client to remote servers, and a browser to display the accessed data on the mobile device. The browser that is used for mobile telecommunications devices is conventionally known as a

10   microbrowser, which is controlled by keys on the mobile device. Instead of using a mouse-driven cursor, a focus region is provided, which can be navigated around the display by keys which may include a scrolling key on the mobile device. The keys may be so-called soft keys which can be pre-programmed to perform different functions depending on the display

15   provided by the browser. Conventionally, one of the soft keys allows the user to move backwards through previously visited network addresses. Also, a bookmark list may be stored so that individual network addresses can be readily accessed.

20   In conventional Internet browsers for use on personal computers, such as Microsoft Internet Explorer and Netscape Communicator, back and forward buttons are provided in the browser display, to be actuated using the mouse and associated cursor. The cursor is moved using the mouse to overlie the button concerned e.g. the back button, and the left mouse button is then

25   actuated so as to actuate the back button on the display, so as to allow the user to navigate between previously accessed network addresses. The forward button is operated in a similar way. The back and forward buttons may have an associated facility to display a list of the previously visited sites from which the user can select an individual address using the cursor. Also, US 5 854 630

30   discloses a browser in which a list of visited network addresses is displayed

when placing a cursor above the back or forward button in combination with long presses of either of the buttons. However, the mouse and cursor based functionality of a conventional Internet browser is not appropriate for a microbrowser used in a mobile communications device and so the speed of browsing with a microbrowser is significantly impaired as a result of the inability to readily access previously visited network addresses.

Summary of the invention

According to the invention, a mobile telecommunications device is provided, which includes a browser to navigate between different pages and display information therefrom. A key on the device is operable in a first mode e.g. a relatively short press, to navigate between previously visited pages. The key is also operable in a second mode e.g. a relatively long press, to provide a selective display of previously visited pages such as homepages so that the user can select a homepage from the previously visited homepage display and navigate directly to the selected homepage.

The key may be configured to navigate backwards through the previously visited pages or forwardly.

By displaying the previously visited homepages in the second mode, the user can use the key in order to navigate quickly back to the homepages of previously visited sites without having to pass laboriously through all the previously displayed network addresses for the non-homepage decks and cards visited during a particular session as occurs in the first mode.

The mobile telecommunications device may include a scrolling key operable by the user to scroll a focus region through the display of previously visited homepages for selecting one of them. A further key may be provided for

selecting a homepage from the previously visited homepage display so that the browser navigates directly to it.

The device according to the invention may comprise a mobile telephone handset or a PDA.

Thus, in accordance with the invention, the user of a mobile device can readily display previously visited homepages and immediately navigate to them but without needing prior mouse and cursor based technology used in conventional personal computer browsers.

Brief description of the drawings

In order that the invention may be more fully understood an embodiment thereof will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a schematic block diagram illustrating a mobile telephone handset which can communicate through a public land mobile network (PLMN) and through a gateway to remote data servers;

Figure 2 is a schematic block diagram of the circuitry of the mobile handset shown in Figure 1;

Figure 3 illustrates schematically the display of the handset and the associated keys 4;

Figure 4 illustrates the display produced by a long depression of one of the soft keys

Figure 5 is a schematic diagram of the homepage data held in memory; and

Figure 6 is a schematic flowchart of a process for displaying the homepages previously visited so that one of them can be selected.

Detailed description

In Figure 1, a mobile station in the form of a battery driven telephone cellular handset MS 1, is shown schematically in radio communication with PLMN 1. The mobile handset MS1, includes a microphone 2, keypad 3, soft keys 4, a liquid crystal display device 5, ear-piece 6 and internal antenna 7.

The circuitry of the handset MS 1 is shown in more detail in Figure 2. Signal processing is carried out under the control of a digital micro-controller 8 which has an associated RAM/ROM 9 and flash memory 10. Electrical analogue audio signals are produced by microphone 2 and amplified by pre-amplifier 11. Similarly, analogue audio signals are fed to the ear-piece 6 through an amplifier 12. The micro-controller receives instruction signals from the keypad and so-called soft keys 4a,b,c, and controls operation of the LCD display 5.

Information concerning the identity of the user is held on a smart card 13 in the form of a GSM SIM card which contains the usual GSM international mobile subscriber identity and encryption K_i that is used for encoding the radio transmission in a manner well known *per se*. The SIM card 13 is removably received in a SIM card holder 14. Radio signals are transmitted and received by means of the antenna 7 connected through a r.f. stage 15 to a codec 16 configured to process signals under the control of a micro-controller 8.

Thus, in use, for speech, the codec 16 receives analogue signals from the microphone amplifier 11, digitises them into a form suitable for transmission and feeds them to the rf stage 15 for transmission through antenna element 7 to PLMN 1 shown in Figure 1. Similarly, signals received from PLMN 1 are fed through the antenna element to be demodulated by the rf stage 15 and fed

to codec 16 so as to produce analogue signals fed to amplifier 12 and ear-piece 6.

The mobile station MS1 is also configured to operate as a client to receive
data from remote servers and to communicate through PLMN 1 to a gateway
18 shown in Figure 1 which acts as a proxy server for connection to remote
servers, such as server 19. For example, for a WAP enabled system, access to
the gateway 18 is provided by dialling a telephone number associated with the
gateway although other communication techniques can be used e.g. for GPRS
and UMTS. The server 19 may provide data corresponding to individual sites
each with an individual homepage with a specific network address or universal
resource locator (URL). The data may be provided in WML through the
PLMN 1 to the handset MS1, which acts as a mobile client.

The mobile handset MS1 runs a microbrowser. The software for running the
microbrowser may be held in flash memory 10 shown in Figure 2, so as to be
run by the micro-controller 8 and provide a display on display 5.

An example of the display provided by the microbrowser is shown in more
detail in Figure 3. In this example of the display 5, the user has accessed the
homepage of a service provider TV2 as illustrated by information bar 20. A
homepage for TV2 is shown with menu options "news", "weather" and
"sport". These menu options comprise links to subsequent pages within the
site, each with their own network address. The links may be selected using a
so-called focus region 21 which can be scrolled upwardly and downwardly
shown in Figure 3 using key 4c, which can be pushed upwardly and
downwardly in the direction of arrow 22 in order to perform a scrolling
function. Thus, as shown in Figure 3, the network address corresponding to
"news" falls within the focus region 21.

Soft keys 4a and 4b are attributed functions shown on the display 5, which varies from display to display. For the homepage TV2 shown in Figure 3, the keys 4a, 4b are attributed functions "options" and "back" respectively and appropriate legends 4a' and 4b' are displayed on the lcd display 5 under the control of software being run by controller 8. If the key 4a is actuated, a list of options e.g. select, re-load, help etc are displayed (not shown) on the display 5 . The "select" function may then chosen from the displayed list using the scrolling key 4c, in the event that the user wants to actuate the link to the "news" features shown on the homepage of Fig. 3. At this time, the soft key function attributed to the key 4a is itself "select" so that an operation of the key 4a will cause the link to the news page within the focus region 21 to be actuated and navigation to the "news" network address is carried out. Once the news page or deck is reached, the key 4b is attributed with function "back" and so actuation of the key 4b returns the user to the screen display shown in Figure 3. Similarly, if the key 4b shown in Figure 3 is actuated, the user will be returned to the screen display associated with the previously navigated network address, namely "news". Thus, successive actuations of the soft key 4b, when attributed its "back" function causes the display to move back to the previous network address display. This may be made up of homepages for individual sites and pages cards or decks within individual sites. It will understood that typically during a data session, a user will go to a site, navigate through addresses within the site, then move to another site and perform similar operations. Thus, successive operations of the back key will call back the network addresses successively in a reverse sequence to that in which they were visited

Actuation of the "back" soft key 4b as described so far, is in a first mode, in which the key is actuated for a relatively short period e.g. less than one second, according to conventional keypad operation. However, in accordance with the invention, the soft key 4b can be operated in a second mode, of

longer duration e.g. greater than one second to provide a display of previously visited homepages as shown in Figure 4.

In this particular data session, the user has previously navigated homepages for Post Denmark and IBM Denmark and the long-press operation of key 4b i.e. in the second mode, has produced a display of links to these homepages as shown in Figure 4. The individual network addresses associated with pages decks or cards within these sites that were navigated previously were not shown in the display of Figure 4.

The soft key 4a is attributed a "select" function so that the user can scroll using key 4c to select one of the homepages Post Denmark and IBM Denmark, by appropriately moving the focus region 21 and operating the select key 4a.

Thus, during a data session, the user can readily return to one of the homepages previously visited by operating the key 4b for a relatively long period, in the second mode, to produce a list of previously visited homepages and then quickly select one of them rather than go back successively through the individual network addresses by operating the key 4b in the first mode.

Figure 5 illustrates the memory organisation of the RAM/ROM 9 shown in Figure 2. Memory locations corresponding to URLs for the visited homepages are cached separately for subsequent recall in the second mode.

The process performed by controller 8 for operation of the key 4b is illustrated schematically in Figure 6. When an operation of the soft key 4b is detected at step S6.1, a determination is made at step S6.2 whether the key was operated in the first or second mode i.e. whether it was pressed for longer than one second. If so, the homepage list shown in Figure 5 is displayed on

display 5, as shown at step S6.3. This results in the display shown in Figure 4. If a homepage URL is subsequently selected by operation of scroll key 4c and select key 4a shown in Figure 4, the browser navigates to the selected URL and the homepage is displayed on the display screen 5, including its menu options, as illustrated as step S6.6 i.e. in the manner shown in Figure 3.

If at step S6.2, it is determined that the key 4c was operated in the first mode i.e. a short press of less than one second, the browser moves back to the previously displayed network address. This may be an individual page or card or a homepage depending on the sequence of network addresses visited by the user previously.

Many modifications and variations falling within the scope of the invention will be evident to those skilled in the art . For example, whilst the described example utilises a "back" function for the soft key 4b, it will be understood that one of the soft keys may be attributed a "forward" function to enable forward navigation through previously visited homepages when operated in the second relatively long-press mode. Also, different ways of selecting the first and second mode can be used. For example, the second mode could be selected by two short key operations in close succession rather than one long key press and other alternatives will be readily apparent to those skilled in the art.

The invention is not restricted to the use of WAP technology but can be used in any mobile telecommunications system in which mobile devices act as clients for remote servers. Also, whilst the invention has been described in relation to the example of a telephone handset, it can be used in other mobile devices such as PDAs, gaming devices and remote handheld devices for home entertainment systems.